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PHYSICAL SCIENCES VISTAS

PERSPECTIVES ON EXCELLENCE IN MISSION OPERATIONS | ISSUE 3 2021

INSIDE

Los Alamos NATIONAL LABORATORY

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On the cover: An illustration depicting some of the work involved in a LANL team effort to produce and directly measure nuclear reactions on radionuclides with half-lives as short as six days. In recognition of this accomplishment the team received a 2020 LANL Large Team Distinguished Performance Award.

Inside cover: The side-coupled portion of the LANSCE linear accelerator used to increase energy from 100 MeV to the 800 MeV required for the radionuclide nuclear reaction measurements.

Physical Sciences Directorate

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FROM TONI'S DESK

Toni Taylor, Associate Laboratory Director for Physical Sciences

I am proud to introduce the third 2021 issue of *Physical Sciences Vistas*, which focuses on "excellence in mission operations." Excellence in mission operations is essential to our directorate's ability to successfully deliver science, technology, and engineering supporting the Lab's National Security mission.

In this issue, highlights of our contributions to mission operations include descriptions of the following.

- How exact and scrupulous planning in concert with sophisticated science enabled a first-ever direct measurement of a radionuclide with a half-life as short as six days. The work, which included operations at the Los Alamos Neutron Science Center's (LANSCE) Weapons Neutron Research Facility and the Isotope Production Facility's hot cell facility, is a boon for both astrophysics and weapons science.
- An introduction to Christie Davis and her role in ensuring the Lab's execution of simultaneous excellence.
- A look at progress by AOT's Target and Experimental Support Team in reclaiming long-dormant space in a radiological controlled area for new work improving target systems for the Lujan Center.
- A story showcasing a cross-organizational effort to minimize the directorate's legacy and environmental footprint. Staff from across the Lab joined together to ensure the safe and efficient disposal of Rocky Flats legacy waste stored in a transportainer at the Target Fabrication Facility.
- How the Lab's Utilities and Infrastructure experts collaborated with stakeholders in our directorate to safety execute preventive maintenance on the LANSCE mesa's large electrical substation. The Safe Conduct of Research principles provided a common framework for the planning and process.
- A description of the resources called upon and the procedures undertaken by MPA to inventory the division's time-sensitive chemicals, including the careful and conscientious response of an alert team member when something seemed amiss.

In an example of excellence in mission-focused science, technology, and engineering we highlight the development of a new capability that enables the visualization of magnetic fields, in situ, during dynamic experiments. The collaboration between DEVCOM Army Research Laboratory, Los Alamos, and Nevada National Security Site researchers leverages the capabilities of the Lab's Proton Radiography Facility and aids efforts to predict how current flows through harsh, multi-material environments.

Finally, I am happy to have the opportunity to share details of how you can contribute to the Lab's participation in the nationwide American Physical Society's Inclusion, Diversity, and Equity Alliance (APS-IDEA). The volunteer-based Lab chapter is collecting data on where efforts should be focused, is developing guidelines on best hiring and mentoring practices, and is exploring ways to broaden the hiring pipeline as well as enhance the sense of "belonging" for underrepresented groups at LANL and in the community. If you would like to add your voice to this effort, I encourage you to reach out to one of the contacts listed in this issue's "Excellence in community relations" feature.

As part of that initiative, ALDPS is hosting a series of brown bag discussions focused on diversity, inclusion, belonging, and equity. The next event, in early September, is a talk by MPA-11's Tommy Rockward on "Breaking the ice: But I was only trying to help." Look for details in your inbox or on the ALDPS web page.

Toni

From left, Mel Borrego, Brad DiGiovine, and Tim Medina use an overhead crane to position the instrument cask containing the nickel-56 sample into the base of hotLENZ—and ultimately Weapons Neutron Research Facility flight path 90L.

HotLENZ experiment goes to extremes to probe **physics in harsh environments**

In a demonstration of sophisticated science performed in tandem with meticulous operations, a multidisciplinary team from across the Lab recently completed a novel nuclear physics experiment that will benefit both astrophysics and weapons science. When a star goes supernova or a nuclear explosion takes place, a unique signature is left behind that includes chains of radionuclides. In both cases, direct measurement of many—even most—of these reactions is nearly impossible and understanding is empirical in nature.

Now, a Los Alamos team has directly measured nuclear reactions on LANL-produced radionuclides with half-lives as short as six days. This first-ever accomplishment represents the first credible path to making direct measurements on many key short-lived radionuclides in a laboratory. For its work, the team was recognized with a 2020 Laboratory Large Team Distinguished Performance Award.

The technique developed to capture these extreme physics phenomena required years of planning to identify and address potential hazards associated with the entire process—from creating highly radioactive materials to installing them in an experimental area. The effort relied on experts from a wide range of disciplines working in facilities that included the Los Alamos Neutron Science Center's Weapons Neutron Research Facility and the Isotope Production Facility's (IPF) hot cell facility on the Pajarito Corridor.

"This operation was designed with a tight tolerance and commissioned multiple times to estimate failure rate and repeatability in the laboratory, before operating with a radioactive material," said Principal Investigator Hye Young Lee (Nuclear and Particle Physics and Applications, P-3).

The team rehearsed the complete procedure multiple times, a scaling-up process crucial to estimating the final hazard level. Within the established safety boundary, they designed and employed engineering controls and back-up plans to reduce risk. The most critical—for a first-time operation with a highly radioactive material—was potential high-dose radiation exposure or contamination. The work also required specialized transport container use, heavy shielding installation, overhead crane and forklift operation, complex high-hazard material moves, and rigorous communication between all organizations involved.

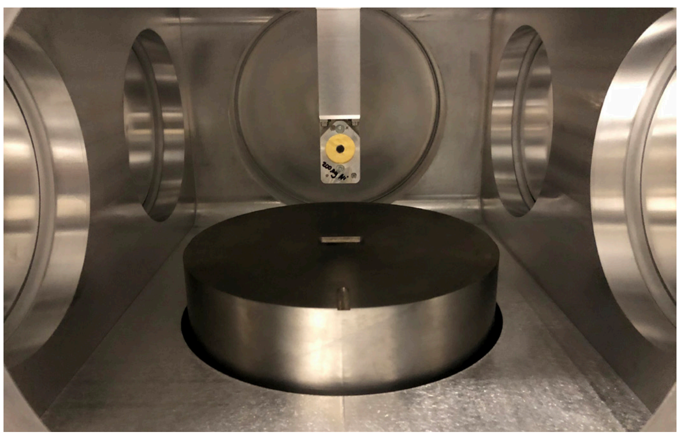
For the final, full production, a nickel-56 sample, which has a half-life of approximately six days, was fabricated and packaged for transport in the IPF TA-48 hot cells. It was swiftly transported inside a tungsten cask to the Weapons Neutron Research Facility, which provided the neutron energy and flux required for the study. Using the overhead crane in flight path 90L, this cask was disassembled as a part of hotLENZ, (for "hot" low-energy neutron-induced charged-particle [Z]), a fully automated sample-handling vacuum chamber specially designed for this final high-dose experiment. This hands-off operation ensured no workers were present in the flight path while the sample was positioned out of the cask to the beam axis.

While the experiment results are preliminary, Lee said the direct measurements "certainly enhance our understanding of nuclear reaction mechanisms and the fidelity of nuclear data for various applications." ■

continued on next page ▶

HotLENZ experiment continued ...

Radiation control technician Rosliann Miller checks the dose rate on the shipping container (metallic drum) after the nickel-56 was loaded in the IPF to be transported to the Weapons Neutron Research Facility flight path 90L.



A natural nickel sample positioned on gold foil inside hotLENZ. The sample was remotely positioned in the beam axis from the tungsten cask during a dry-run for the same process with radioactive nickel-56.

Get the details

Mission relevance: The work supports the Lab's National Security and Fundamental Science missions and its Nuclear and Particle Futures science pillar. **Participants** included Rosliann Miller, Kevin Andrews, Mike Duran (Radiation Protection and Field Support, RP-FS); Lauren Overbay (Advanced Nuclear Technology, NEN-2); Dave Reass, Ross Capon, Michael Connors, Mark Brugh, Etienne Vermeulen, Cecilia Lledo, Veronika Mocko (Inorganic Isotope and Actinide Chemistry, C-IIAC); Michael Mocko, Mel Borrego, Tim Medina (Applied and Fundamental Physics, P-2); Eron Kerstiens, Jordon Marquis (Accelerator Operations, AOT-OPS); David Ballard (Mechanical Design Engineering, AOT-MDE); Hye Young Lee, Sean Kuvin, Brad DiGiovine (Nuclear and Particle Physics and Applications, P-3). **Funding:** Laboratory Directed Research and Development Program, DOE NNSA Office of Experimental Sciences, and the DOE Isotope Program, managed by the Office of Science for Isotope R&D and Production. **Technical contacts:** Hye Young Lee, Etienne Vermeulen

MEET CHRISTIE DAVIS

Technical Project Manager, Sigma Operations (Sigma-OPS)

Making and maintaining connections is paramount in Christie Davis's line of work. Davis is a technical project manager assigned to the ALT940 effort and Critical Supplier Initiative (CSI) and team leader for the division's Business Process Improvement Team. She serves as a link between Sigma R&D staff and Lab operations personnel and colleagues at other DOE national laboratories and manufacturing vendors in private industry. In doing so, she plays a pivotal role in allowing Sigma staff to be able to focus on R&D for future programmatic mission work and ensuring that key services are delivered to programs that support the Lab's National Security mission.

"The challenging part of my job is helping folks—both LANL and external—understand government policies and procedures and working through the growing pains with them," she said. To avoid project teams "getting caught up in unintentional operational nightmares," Davis said, she relies on her experience honed through a range of positions at the Lab and as a construction/maintenance administrator prior to joining LANL. This includes skills in facilities and operations support, hazardous materials handling and compliance, environmental management, safety and security protocols, and sustainable business practices.

Excellence in mission operations is essential, she said. "Rigorous attention to detail and adherence to complex policy guidance serve as an assurance to customers and stakeholders that the Lab can execute its programmatic and scientific missions."

Davis said she finds satisfaction, in particular, in the progress of the CSI project. What started as a pilot program to find a classified machining vendor for the 30-pits-per-year mission has grown to include multiple vendors, additional DOE/NNSA program offices, and other national labs. The project provides long-term stable work and technology maturation for private industry and allows Lab and industry experts to share their knowledge through technical readiness teams. Given her past efforts in succession planning and knowledge transfer, she said, "this project speaks to my heart because it goes beyond our local LANL community and extends to the entire DOE Complex and the nation." ■

Adapting workspace proves key to **responsive** accelerator target **maintenance operations**

When beam operations ceased in Area A at the Los Alamos Neutron Science Center (LANSCE) nearly 25 years ago, the doors closed on the adjacent machine shop. Left to gather dust were tools and equipment once deemed essential to supporting complex atomic and subatomic physics experiments that were performed in the cavernous 4,000-square-foot space. Now, as the space is being converted for a new purpose, those same items presented a disposal challenge due to their storage in a radiological controlled area.

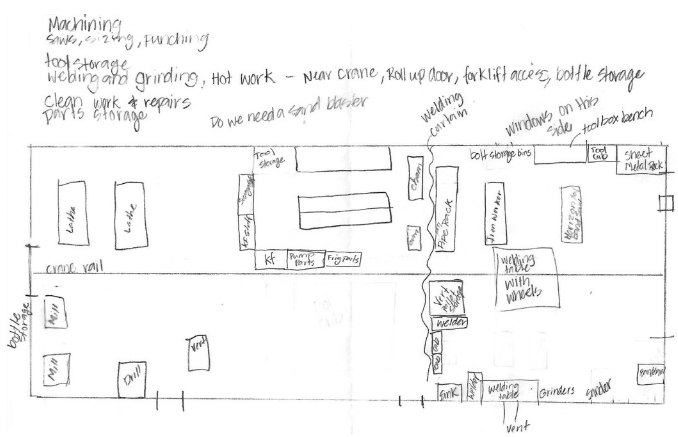
As improvements to the target systems supplying low-energy neutrons to experiments in the Lujan Center get underway, the team responsible for the work is adapting the space to fit its needs. Accelerator Operations and Technology's five-member Target and Experimental Support Team (TEST) is designing, fabricating, and installing high-maintenance elements of the target systems, including radioactive coolant water and cryogenic, vacuum, and support systems. In reclaiming the space, the team is using the 5S +Safety process to ensure safety and eliminate inefficiencies. 5S + Safety is a Laboratory initiative for creating order in the workplace.

The disorganization was frustrating for everyone involved, according to TEST member Jordon Marquis. "We needed to identify what we do and what assets we needed and how often we needed them," he said. After identifying key tasks and equipment, Marquis and his team members were buoyed by the sense of momentum created by the organized group effort. "Although cleaning up the past can sometimes be very daunting, seeing the progress unfold and realizing the efficiencies gained have brought excitement and a sense of ownership to the team," said Accelerator Operations (AOT-OPS) Group Leader Eron Kerstiens.

Already hundreds of pounds of safety-compromised tools and thousands of pounds of metal have been removed. More than 500 square feet of new floor space has been cleared. As a result of the organized and defined work spaces, tasks—such as cryogenic refrigerator maintenance and welding and assembling of piping systems—can be efficiently completed, thereby reducing inconveniences and the potential for errors. ■

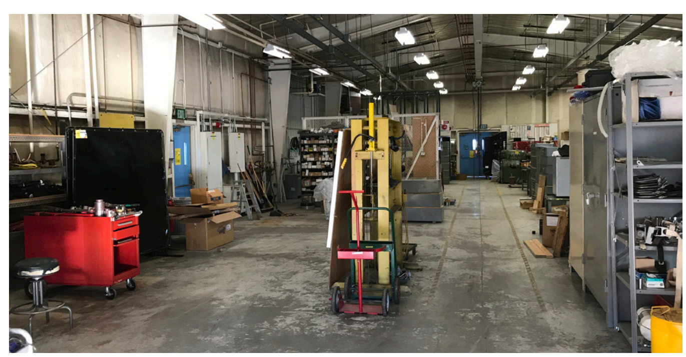
Get the details

These efforts were supported by the Physical Sciences Directorate's 5S+Safety Program with assistance from staff from across the Laboratory. **Participants** include Jordon Marquis, Sean Hollander, Ryan Smeltzer, Hargis James, Esteban Garcia (Accelerator Operations, AOT-OPS); Jacki Mang (LANSCE Facility Operations, LANSCE-FO); Louis Peterson (Accelerator Operations and Technology, AOT-DO); Kelsey Arcocha, Isaac Atencio (Waste Generator Services, WM-WGS); Lauren Overbay (Advanced Nuclear Technology, NEN-2); Mike Duran, Kevin Andrews, Heather Apodaca, Alejandra Loya-Munoz (Radiation Protection Field Support, RP-FS). **Technical contact:** Jordon Marquis



The team sketched a lay out of the space to visualize efficient and safe operations. Easy access to critical infrastructure was essential. These resources included tools for mechanical fabrication activities and cranes and forklifts for heavy equipment work.

The former machine shop, shuttered more than two decades ago, was stocked with legacy equipment that was challenging to dispose of due to its use in a radiological controlled area.



The space, which features a high bay, large doors, ventilation, and plenty of room to maneuver, is now streamlined for the team's work, which includes machining, welding, electrical maintenance, and performing target module component quality assurance, target assembly, and target removal.

Sound safety culture sets a standard for stewarding the past—to benefit the future

In keeping with the Physical Sciences Directorate's environmental goal to "clean the past," Miquela Sanchez (Engineered Materials, MST-7) and Lab experts in waste management and radiation protection teamed up to tackle the disposal of Rocky Flats legacy waste long stored in a transportainer at the Target Fabrication Facility.

By putting the Safe Conduct of Research principles into practice, the team successfully had the container of low-level, radioactive waste removed off site earlier this summer. The result is an improved working environment for daily facility operations, including additional room for 18-wheelers to efficiently deliver cryogen from the co-located gas plant. It also decreases potential for adverse environmental impact on area walking trails and animal habitats in nearby canyons.

To maintain a culture of safety, Sanchez and her colleagues secured funding for the endeavor, enacted environmental protection and cost-saving measures, and worked with personnel across the Lab and the DOE Complex to overcome operational and administrative challenges. Sanchez said it was gratifying to know "that so many cross-organizational personnel were all on board to see [the waste] removed and ensure our environmental footprint was minimized."

To identify hazards, the team engaged industrial hygienists and radiation protection professionals to assess, characterize, and document the waste. A questioning attitude resulted in a check by pest control experts prior to opening the container. Maintaining a healthy respect for what could go wrong, the team secured a new, safety-compliant transportainer from Idaho National Laboratory. The acquisition, an initiative of John Kelly (Waste Management, WM-DO), resulted in a cost savings of $10K.

In the process of raising concerns and having a questioning attitude that ensured everyone was equally heard and respected, a strong safety culture evolved for all involved, Sanchez said. ■

Above, one of three crates of legacy waste that was loaded into a new, safety-compliant transportainer. Below, the transportainer is loaded onto the truck for off-site disposal.

Get the details

Participants include Miquela Sanchez (Engineered Materials, MST-7); Ronnie A. Garcia, Rodger Begay, Darryl Garcia, Candie Arellano (Waste Generator Services, WM-WGS); John Kelly (Waste Management, WM-DO); Dianne Wilburn (Integration Program Office, ESHQSS-INT); Antonio Maestas, Rachel Sanchez (Radiation Protection Field Support, RP-FS); Todd Eastman, Victor Garde, Patrick Kennedy (Waste Management Services, WM-WMS); Heather Blumer (Occupational Safety and Health Deployed Services, OSH-DS); Janice Salazar (Integration Program Office, ESHQSS-INT); Edward Freer (Science and Technology Operations, MSS-STO); Ashley Mathews (Nuclear Material Control and Accountability, SAFE-NMCA); Lee Abeyta (Property Management, LOG-PM); John Tyler Dunwoody (Materials Science in Radiation and Dynamics Extremes, MST-8); Bernadette Lopez, Randy Martinez, Desiree Lujan, Sandra Gonzales, Ovy Valencia (Logistics Heavy Equipment Roads and Grounds, LOG-HERG); Kevin Thronas (Logistics Central Shops, LOG-CS); Mychal Hunter (Logistics Superintendent Field Work Execution, LOG-SUP). The team wishes to acknowledge the contributions of the late Gail Roach, who originally set this project in motion. The work supports Target 7, "The reduction of legacy equipment and materials," in Objective 3, "Clean the past," of the directorate's FY2021 Environmental Action Plan. **Technical contact:** Miquela Sanchez

Robust teamwork essential to safe operation of Lab's linear accelerator

The Los Alamos Neutron Science Center (LANSCE) is unique due to the intensity and energy spectrum of the neutrons produced by its half-mile-long linear accelerator. The 800-MeV, high-intensity accelerator races a pulsed beam of protons to 84% of the speed of light. These hurtling proton pulses are customized and delivered simultaneously to five research facilities that support civilian and national security research.

Maintaining this instrument at peak performance requires close collaboration between teams of engineering, operations, and maintenance workers.

During the accelerator's annual maintenance outage earlier this year, members of the Utilities and Infrastructure Division completed preventive maintenance on the mesa's large substation. The project, carried out every six years, involves a total loss of power to facilities on the north side of the mesa and much of the power to the south side.

In 2015, when this work was last performed, an electrical foreman was seriously injured in an arc flash event—a type of electrical explosion or discharge that results from a connection through air to ground or another voltage phase in an electrical system. The lessons learned from this event were many and changed the way this complex work is performed.

Months in advance of this maintenance, Utilities began meeting regularly with members of Facility Operations (LANSCE-FO), Maintenance and Site Services, Accelerator Operations and Technology, and other mesa stakeholders. "This planning incorporated significant changes in the way this work would be done by using several of the Safe Conduct of Research (SCoR) principles," said Facility Operations Director Gary Hagermann (LANSCE-FO).

Specifically, work was planned for a longer outage period to ensure that time pressure was not an issue and that all work could be executed at a safe pace. SCoR principle #5—"A questioning attitude is cultivated"—"gives employees the time to view the work space and complete a turnover without having to worry about the time constraint," Hagermann said. Work planning allowed for application of SCoR principles #7—"Hazards are identified and evaluated for every task, every time"—and #8—"A healthy respect is maintained for what can go wrong."

"The additional controls, coordination with tenants, and work culture changes resulted in the successful completion of an inherently dangerous preventive maintenance project, ensuring continued operation of the LANSCE accelerator and TA-53 as a whole," Hagermann said. ■

Top: The work was done during a four-day complete outage to alleviate pressure on workers. Center and bottom: Visual indicators to increase safety include barricades and signs separating work areas and off-limits sections and flashing green lights to identify equipment that is safe to work on.

Get the details

The work was performed by the Utilities and Infrastructure (UI) maintenance, operations, and engineering teams and Logistics (LOG-CS) and was supported by Maintenance and Site Services (MSS) teams at LANSCE. **Technical contact:** Gary Hagermann

Formulating a plan to monitor the state of time-sensitive chemicals

As the Lab ramps up onsite operations, many are returning to workspaces that have been untouched for several months. Picture an office with a wall calendar flipped to March 2020.

Now, picture a lab with chemicals that have been unused just as long. If they are time sensitive, those chemicals have the potential to become like a banana left too long in a lunchbox. They can develop hazards that were not present in the original formulation.

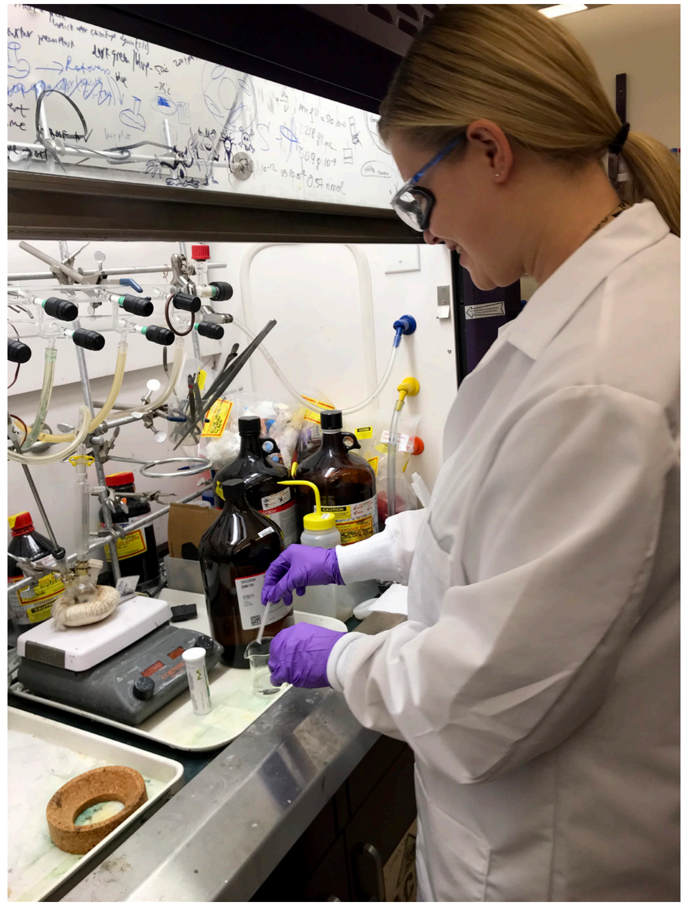
In an example of the Safe Conduct of Research, members of the Materials Physics and Applications' (MPA) Chemical Inventory Team recently assessed the state of more than 360 time-sensitive compounds owned by the division in the Lab's "ChemDb" database.

Hazardous chemicals may develop from inappropriate or improper storage or from simply being stored too long. Time-sensitive chemicals include materials that become shock sensitive upon evaporation of a stabilizer, that form peroxide, or that generate significant additional hazards by undergoing slow chemical reactions.

"It takes an army," said MPA Safety and Process Coordinator Ricardo Martí-Arbona, who marshaled the resources to complete the inventory.

With points of contact in each group and in each lab location, clear communication to team members was essential. "It's important to have a plan," he said.

Instructions, supporting documentation, and safety pointers to clarify expectations were prepared after counsel from chemical management experts. Armed with this material, members of the MPA Chemical Inventory Team were called up to perform the assessment. Test strips and other essential equipment were supplied. Division management was enlisted to provide support. Emergency Management was given a heads up and was ready to act in the event of the unexpected.



As part of the MPA time-sensitive chemical inventory, Anastasia Blake uses a test strip to analyze an organic solvent that is capable of forming peroxides.

And while most issues that did arise were related to interpreting guidance, indeed, during the inventory a team member observed a situation that prompted a response from the Lab's hazardous materials team. Noticing that a liquid chemical had now become a solid, the team member immediately paused work, called the Laboratory's 7-2400 hot line, and notified management. Hazardous materials response specialists were mobilized to test the compound, which was ultimately determined to be in a safe configuration and required no further action.

As a result of the cataloging, about 6% of time-sensitive chemicals were deemed unnecessary. Their safe disposal removed a potential hazard and increased awareness among the team members regarding which chemicals are in storage, thus making the next inventory in six months more efficient. ■

Get the details

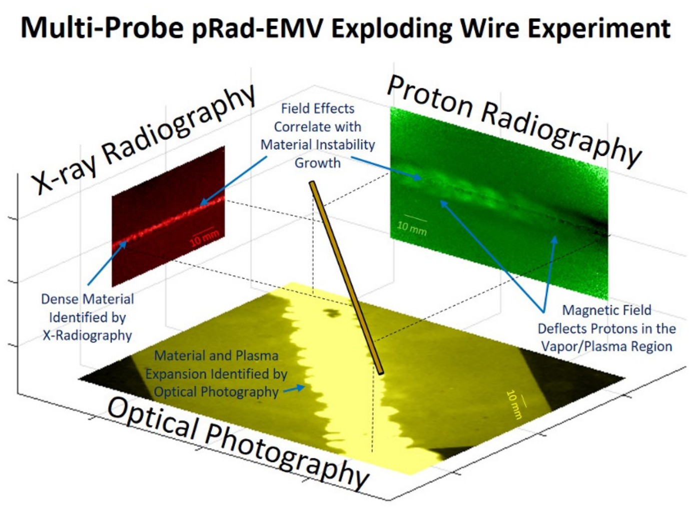
The work was performed by members of the Materials Physics and Application Division's Chemical Inventory Team with assistance from institutional subject matter experts and directorate management. **Technical contact:** Ricardo Montí-Arbona

Collaboration develops pRad technique to visualize electromagnetic fields

Predicting how electrical current flows through complex, multi-material environments, including phenomena such as dynamic material failure and fragmentation, is difficult. Complications of failure dynamics including instability growth and new surface generation combine with turbulent mixing and material phase transformations to produce continually varying conduction properties. The capability to predict how current flows through these harsh environments, however, is crucial to the development of advanced Department of Defense protection and lethality concepts, and appeals to a broad spectrum of pulsed-power/high-potential electrical applications.

To advance on the electrical flow prediction capability, scientists from DEVCOM Army Research Laboratory, Los Alamos National Laboratory, and Nevada National Security Site have developed an experimental campaign to explore using LANL's lens-based Proton Radiography (pRad) Facility to radiograph targets that purposefully include electromagnetic fields. The result led to development of a new capability allowing for visualization of magnetic fields, in situ, during dynamic experiments. The capability is similar to that of proton deflectometry, but benefits by using the accelerator-generated 800-MeV protons and removal of the detector system from the potentially harsh local target environment. The technique provides the capability to supply vital insight to theory development and code validation of electrical flow by allowing for visualization of the electromagnetic states during the conduction process.

To demonstrate the technique's usefulness, a series of multi-probe experiments were conducted in which 1.6-mm-diameter copper rods were electrically energized and burst using a capacitive drive. The experiments paired the pRad electromagnetic visualization (pRad-EMV) technique with multi-pulse flash x-ray radiography and optical photography to assess the dynamic electrical and material states, simultaneously. After validating the pRad-EMV technique using targets that produced known magnetic fields of closed-form solution (i.e., electrically energized straight rod), the system was used to inspect multiple aspects of dynamically changing electrically burst rods. The experiments inspected magnetic fields of magnitudes up to ~40T generated by currents of up to ~150kA propagating through dynamic events containing conducting and insulating particles, gases, and plasmas. The results are currently being analyzed and will be used to assess theory and validate magnetohydrodynamics models. ■



Multi-probe assessment, including pRad-EMV, x-ray radiography, and optical photography, of an electrically energized and burst wire. The dark copper-colored rod superimposed in the center of the figure represents the position of a 1.6-mm-diameter copper rod prior to electrical impulse. Using multiple diagnostics simultaneously allowed for temporal assessment of the material states and the magnetic field structure (correlated with electrical conduction paths) throughout the bursting process.

Get the details

Mission relevance: The work supports the Lab's National Security Science mission and Materials for the Future and Nuclear and Particle Futures science pillars. **Participants:** DEVCOM Army Research Laboratory researchers include M.B. Zellner, W.C. Uhlig, P.R. Berning, R.L. Doney III. LANL researchers include L.P. Neukirch, M.S. Freeman (Dynamic Imaging Radiography, P-1); J.T. Bradley III, H.J. Gaus III, L.N. Merrill (RF Engineering, AOT-RFE); C.H. Wilde, W.Z. Meijer (P-1). Nevada National Security Site researchers include D. Phillips, D. Guerrero, L. Fegenbush. **References:** A. J. Mackinnon, P. K. Patel, R. P. Town, M. J. Edwards, T. Phillips, S. C. Lerner, D. W. Price, D. Hicks, M. H. Key, S. Hatchett, S. C. Wilks, "Proton radiography as an electromagnetic field and density perturbation diagnostic," *Review of Scientific Instruments*, 75, 10 (3531) (2004); F. Beg, M. Weis, "Assessment of proton deflectometry for exploding wire experiments," DE-SC-0001992 final report, Sept. 2013. **Technical contacts:** M.B. Zellner or L.P. Neukirch/M.S. Freeman

Lab steps up in **expanding diversity, equity, and inclusion** by joining nationwide APS-IDEA network

With the aim of developing lasting improvements in diversity, equity, and inclusion at the Lab, a LANL chapter of the American Physical Society's (APS) national APS-IDEA network has been formed.

The vision of the 1,500-member APS Inclusion, Diversity, and Equity Alliance (APS-IDEA) is that "as a result of collective efforts, physics and related fields will become more inclusive of all social identities, with a diversity reflective of the nation, and with an equitable distribution of opportunities and resources."

The volunteer-based Lab APS-IDEA team, endorsed by Director Thom Mason and championed by Associate Laboratory Director for Physical Sciences Toni Taylor, intends to develop a sustainable, long-term strategy for diversity and inclusion that is independent of individual efforts and involves the efforts of the institution. It aims to influence policy, practice, training, and overall LANL culture.

The chapter features a shared leadership structure. Individuals from all career levels, fields, and positions are welcome and share an equal voice.

"The national APS-IDEA and LANL team's main focus areas are systemic problems," said team member Nicole Lloyd-Ronning (Computational Physics and Methods, CCS-2). Through committees—in allyship and mentorship, hiring and retention, student recruitment and support, and community building—LANL members work with the national program to bring focus for more effective change, she said.

For example, there are many existing Lab student programs that target underrepresented groups. Leveraging the national APS-IDEA network, recruiting efforts can be expanded. With access to peer-reviewed scientific research on inclusion, diversity, and equity best practices, the APS-IDEA team employs proven strategies for affecting real institutional change. "And in meetings with a more focused alliance cohort from the national labs, members can share challenges and approaches that may be unique to federal facilities," said team member Heather Johns (Thermonuclear Plasma Physics, P-4).

Other examples of efforts from LANL's APS-IDEA team include developing a roadmap to increasing diversity in hiring and retention; adding a pronouns option to LANL's standard email signature block; establishing a Lab-wide network of mentors and allies for underrepresented minorities; and identifying needed community partnerships to support institutional efforts on employee diversity, inclusion, and belonging. The team is collecting data on where the Lab needs focused efforts to improving inclusion, diversity, and equity; is developing guidelines on best hiring and mentoring practices; and is seeking ways to broaden the hiring pipeline. ■

Get the details

APS-IDEA contacts: Community Building: Barbara Lynn; Hiring and Retention: Alice Barthel or Roseanne Cheng; Allyship and Mentorship: Heather Johns; Student Recruitment and Support: Priscila Rosa. The team also maintains a shared drive with additional information to which interested individuals can be given access by contacting Nicole Lloyd-Ronning, Heather Johns, or Kathy Prestridge.

Microscopy Team Leader Terry Holesinger (Nuclear Materials Science, MST-16) examines some of the features of the new ThermoFisher 300-kV, monochromated, aberration-corrected (scanning) transmission electron microscope (S/TEM) installed in the Radiological Laboratory/Utility/Office Building (RLUOB). The instrument will be a key part of an actinide microscopy center. Its advanced capabilities will allow for a new look at plutonium and its alloys to help answer many of the outstanding questions related to these complex materials. Overall, the center will be a state-of-the-art materials characterization resource for the Lab's weapons programs that include manufacturing, directed stockpile work, and science campaigns. The S/TEM is one of several new instruments that have recently been purchased and are being installed in the Plutonium Facility and the RLUOB to renew capabilities in actinide microscopy.

Associate Laboratory Director for Physical Sciences: Antoinette J. Taylor

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For more information about this publication, contact aldps-comm@lanl.gov.

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Los Alamos NATIONAL LABORATORY

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